

1. Express the equation $\ln(x+2) = 8$ in exponential form.
- $x = e^2 + 8$
 - $x = e^2 - 8$
 - $x = e^8 + 2$
 - $x = e^8 - 2$
 - $x = 8^{e+2}$
2. Let M vary directly as x and inversely as y . Use the information that if $x = 10$ and $y = -2$ then $M = 50$ to find the constant of proportionality.
- -8
 - 0
 - -6
 - -9
 - -10
3. Find the midpoint of the segment that joins the points $(10, 0)$ and $(0, 4)$.
- $(2, 5)$
 - $(1, 2)$
 - $(5, 2)$
 - $(5, 1)$
 - $(5, 3)$
4. Find a point on the y -axis that is equidistant from the points $(4, -9)$ and $(5, 0)$.
- $(0, -6)$
 - $(0, 5)$
 - $(-4, 0)$
 - $(0, 0)$
 - $(0, -4)$
5. The common ratio in a geometric sequence is $\frac{9}{4}$, and the fourth term is $\frac{7}{4}$. Find the third term.
- $\frac{7}{9}$
 - $\frac{3}{2}$
 - $\frac{9}{7}$
 - $\frac{14}{9}$
 - $-\frac{2}{9}$
6. Find the fifth term of the recursively defined sequence $a_n = a_{n-1} + a_{n-2}$ where $a_1 = 3$ and $a_2 = 5$.
- 16
 - 19
 - 13
 - 24
 - 21
7. Solve the inequality $\left| \frac{x+2}{6} \right| \geq 7$.
- $[-44, 40]$
 - $[44, \infty)$
 - $(-\infty, -44] \cup [40, \infty)$
 - $(-\infty, -44) \cup (40, \infty)$
 - \emptyset
8. Find all the real zeros of the polynomial $P(x) = x^3 + 7x^2 + 9x - 9$.
- $x = 3, x = -3 \pm \sqrt{7}$
 - $x = -2, x = -2 \pm \sqrt{7}$
 - $x = -2, x = -3 \pm \sqrt{17}$
 - $x = -3, x = -2 \pm \sqrt{17}$
 - $x = -3, x = 3 \pm \sqrt{7}$
9. Find all solutions of the equation $7x^2 - 42x + 91 = 0$.
- $x = 3, x = -3$
 - No solutions
 - $x = 2 + 4i, x = 2 - 4i$
 - $x = 3 + 2i, x = 3 - 2i$
 - $x = 12 + 8i, x = 12 - 8i$

10. Rewrite the expression $\log_3 4 + 4 \log_3 2$ as a single logarithm.
- $\log_{64} 3$
 - 1
 - $\log_3 8$
 - $\log_3 64$
 - $\ln 64$
11. Solve the equation $\frac{1}{x} = \frac{13}{8x} + 5$.
- 13
 - 8
 - $-\frac{1}{8}$
 - $\frac{1}{5}$
 - $\frac{1}{8}$
12. Indicate all x - and y -intercepts on the graph of the function $y = x^3 - 27$.
- x -intercept 3, y -intercept -3
 - x -intercept 3, y -intercept 27
 - x -intercept 27, y -intercept 3
 - x -intercept 27, y -intercept -3
 - x -intercept 3, y -intercept -27
13. Use $f(x) = 4x - 9$ and $g(x) = 1 - x^2$ to evaluate $f(g(-2))$.
- 20
 - 288
 - 77
 - 12
 - 21
14. Given that $x = 6$ is a zero of $P(x) = x^3 - 7x^2 - 6x + 72$, find all other zeros of $P(x)$.
- 4 and 4
 - 6 and 6
 - 3 and 4
 - 3 and 4
 - 3 and 3
15. The fox population in a certain region has a relative growth rate of 7% per year. It is estimated that the population in 1995 was 18000. Find a function $n(t)$ that models the population t years after 1995.
- $n(t) = 18000e^t$
 - $n(t) = 18000e^{-0.07t} + 1995$
 - $n(t) = 18000e^{7t}$
 - $n(t) = 18000 + e^{7t}$
 - $n(t) = 18000e^{0.07t}$
16. Find the sum of the infinite geometric series $1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \dots$.
- $\frac{3}{2}$
 - 2
 - 3
 - $\frac{1}{2}$
 - 1
17. Evaluate the expression $\log_2 \sqrt[4]{4}$.
- $\frac{1}{11}$
 - $\frac{2}{11}$
 - 22
 - $\frac{11}{2}$
 - 2
18. Helen earns \$7.00 per hour at her job, but if she works more than 35 hours in a week she is paid $\frac{3}{2}$ times her regular wage for the overtime hours worked. One week her gross pay was \$308.00. How many overtime hours did she work that week?
- 10 hours
 - 7 hours
 - 5 hours
 - 6 hours
 - 40 hours

19. Find all the zeros of the polynomial $P(x) = x^3 + x^2 + 36x + 36$.
- $6i, -6i, -1, 1$
 - $6, -6, 1$
 - $6, -6, 0$
 - $6i, -6i, -1, 0$
 - $6i, -6i, -1$
20. Find the vertex of the parabola $y = 3x^2 + 6x - 11$.
- $(-6, 11)$
 - $(-1, 11)$
 - $(-3, -2)$
 - $(1, -14)$
 - $(-1, -14)$
21. Solve $\frac{3}{7}x + 1 < \frac{1}{7} - 3x$.
- $(-\infty, -13)$
 - $(-\frac{1}{4}, \infty)$
 - $(-\infty, -4)$
 - $(-\infty, -\frac{1}{4})$
 - $(-\frac{1}{13}, \infty)$
22. Solve $\log_3(9 - x) = 5$.
- $x = -243$
 - $x = 252$
 - $x = -234$
 - $x = -252$
 - $x = 243$
23. For the function $f(x) = 3x^2 + 3$, find $\frac{f(a+h) - f(a)}{h}$.
- $6h + 3a$
 - $3h + 6a$
 - $3h + 12a$
 - $9h + 6a$
 - $3h + 3a$
24. Determine the correct equation for the line passing through the point $(1, 16)$ and the point $(12, 6)$.
- $11y + 10x + 186 = 0$
 - $11y - 10x - 186 = 0$
 - $11y + 10x - 186 = 0$
 - $11y - 10x + 186 = 0$
 - $12y - 16x - 6 = 0$
25. The 11th term of an arithmetic sequence is 13 and the 4th term is 6. Find the 27th term.
- 53
 - 16
 - 29
 - 30
 - 27
26. Determine the domain and range of the function $h(x) = 2 - 2^x$.
- Domain: $(-2, \infty)$; Range $(2, \infty)$
 - Domain: $(-\infty, \infty)$; Range $(-\infty, 0)$
 - Domain: $(-\infty, 2)$; Range $(-\infty, \infty)$
 - Domain: $(-\infty, \infty)$; Range $(-\infty, 2)$
 - Domain: $(-2, 2)$; Range $(-2, 2)$
27. Find the inverse function of $f(x) = 9 + \sqrt[3]{x}$.
- $f^{-1}(x) = (9 - x)^3$
 - $f^{-1}(x) = (x - 9)^3$
 - $f^{-1}(x) = (x + 9)^3$
 - $f^{-1}(x) = \frac{1}{9 + \sqrt[3]{x}}$
 - $f^{-1}(x) = x^3 - 9^3$
28. What is the average rate of change of the function $f(x) = x^3 - 5x^2$ between $x = 0$ and $x = 1$?
- 5
 - 11
 - 4
 - 6
 - 8

29. Find the center and radius of the circle for the equation of $x^2 + y^2 - 6x - 10y = -9$.

- a) center (3, 5), radius 5
- b) center (-3, 4), radius 5
- c) center (-5, 3), radius 5
- d) center (5, -3), radius 25
- e) center (-3, -5), radius 25

30. Find the horizontal and vertical asymptotes of the rational function

$$r(x) = \frac{3}{x+6}.$$

- a) horizontal asymptote $y = 0$; vertical asymptote $x = 6$
- b) horizontal asymptote $y = 0$; vertical asymptote $x = -12$
- c) horizontal asymptote $y = 3$; vertical asymptote $x = -6$
- d) horizontal asymptote $y = 0$; vertical asymptote $x = -6$
- e) horizontal asymptote $y = 3$; vertical asymptote $x = 6$

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ITEM NO. FORM: A

1	D
2	E
3	C
4	E
5	A
6	E
7	C
8	D
9	D
10	D
11	C
12	E
13	E
14	D
15	E
16	B
17	B
18	D
19	E
20	E
21	D
22	C
23	B
24	C
25	C
26	D
27	B
28	C
29	A
30	D